

**Final**

**Site Investigation Report**  
**Former Motor Pool Area 3100, 23rd Street**  
**Parcels 147(7), 27(7), 28(7), and 72(7)**

**Fort McClellan**  
**Calhoun County, Alabama**

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## **Table of Contents**

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	<b>Page</b>
List of Appendices.....	iii
List of Tables.....	iv
List of Figures .....	iv
Executive Summary .....	ES-1
1.0 Introduction.....	1-1
1.1 Project Description .....	1-1
1.2 Purpose and Objectives.....	1-2
1.3 Site Description and History.....	1-2
2.0 Previous Investigations .....	2-1
3.0 Current Site Investigation Activities.....	3-1
3.1 UXO Avoidance .....	3-1
3.2 Environmental Sampling .....	3-1
3.2.1 Surface and Depositional Soil Sampling.....	3-1
3.2.2 Subsurface Soil Sampling .....	3-2
3.2.3 Well Installation .....	3-3
3.2.4 Water Level Measurements.....	3-4
3.2.5 Groundwater Sampling .....	3-4
3.2.6 Surface Water Sampling.....	3-5
3.2.7 Sediment Sampling .....	3-5
3.3 Surveying of Sample Locations .....	3-6
3.4 Analytical Program .....	3-6
3.5 Sample Preservation, Packaging, and Shipping.....	3-7
3.6 Investigation-Derived Waste Management and Disposal.....	3-7
3.7 Variances/Nonconformances .....	3-8
3.7.1 Variances .....	3-8
3.7.2 Nonconformances.....	3-8
3.8 Data Quality .....	3-8

## **Table of Contents** *(Continued)*

---

	<b>Page</b>
4.0 Site Characterization.....	4-1
4.1 Regional and Site Geology .....	4-1
4.1.1 Regional Geology .....	4-1
4.1.2 Site Geology .....	4-4
4.2 Site Hydrology .....	4-5
4.2.1 Surface Hydrology .....	4-5
4.2.2 Hydrogeology.....	4-5
5.0 Summary of Analytical Results .....	5-1
5.1 Surface and Depositional Soil Analytical Results .....	5-2
5.2 Subsurface Soil Analytical Results .....	5-3
5.3 Groundwater Analytical Results .....	5-4
5.4 Surface Water Analytical Results.....	5-5
5.5 Sediment Analytical Results .....	5-6
6.0 Summary and Conclusions and Recommendations.....	6-1
7.0 References.....	7-1
Attachment 1 - List of Abbreviations and Acronyms	

## ***List of Appendices***

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Appendix A - Sample Collection Logs and Analysis Request/Chain of Custody Records

Appendix B - Boring Logs and Well Construction Logs

Appendix C - Well Development Logs

Appendix D - Survey Data

Appendix E - Summary of Validated Analytical Data

Appendix F - Data Validation Summary Report

Appendix G - Variances/Nonconformances

Appendix H - Summary Statistics for Background Media, Fort McClellan, Alabama

## **List of Tables**

---

<b>Table</b>	<b>Title</b>	<b>Follows Page</b>
2-1	Sample Data for the Closed-in-Place 2,000-Gallon Waste Oil UST	2-2
3-1	Sampling Locations and Rationale	3-1
3-2	Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Samples	3-1
3-3	Temporary Well Construction Summary	3-3
3-4	Groundwater Elevations	3-4
3-5	Groundwater Sample Designations and QA/QC Samples	3-4
3-6	Groundwater and Surface Water Field Parameters	3-5
3-7	Surface Water and Sediment Sample Designations and QA/QC Samples	3-5
3-8	Variances and Nonconformance to the Site-Specific Field Sampling Plan	3-8
5-1	Surface and Depositional Soil Analytical Results	5-2
5-2	Subsurface Soil Analytical Results	5-2
5-3	Groundwater Analytical Results	5-2
5-4	Surface Water Analytical Results	5-2
5-5	Sediment Analytical Results	5-2

## **List of Figures**

---

<b>Figure</b>	<b>Title</b>	<b>Follows Page</b>
1-1	Site Location Map	1-2
1-2	Site Map	1-2
2-1	Closed-in-Place Waste Oil UST Sample Locations	2-2
3-1	Sample Location Map	3-1
4-1	Site Geologic Map	4-4
4-2	Geologic Cross Section A-A'	4-4
4-3	Groundwater Elevation Map	4-5

## ***Executive Summary***

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In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation (IT) completed a site investigation (SI) at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), consisted of the sampling and analyses of nine surface soil samples, twelve subsurface soil samples, nine groundwater samples, two depositional soil samples, three surface water samples, and three sediment samples. In addition, nine temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

The analytical results indicate that metals, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) were detected in the environmental media sampled. To evaluate whether the detected constituents present an unacceptable risk to human health or the environment the analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan.

The potential impact to human receptors is expected to be minimal. Although the site is currently being used by the City of Anniston as a motor pool area, the soils and groundwater data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, the metals that exceeded residential human health SSSLs, with a few limited exceptions, were below their respective background concentration or within the range of background values, and thus, do not pose an unacceptable risk to future human receptors. The polynuclear aromatic hydrocarbon (PAH) compound benzo(a)pyrene was detected in three surface soil samples and one subsurface soil sample at concentrations exceeding the SSSL. The benzo(a)pyrene concentrations in surface soils were below the PAH background value.

In groundwater, one VOC (chloroform) was detected in four samples at concentrations (0.002 milligrams per liter [mg/L] to 0.004 mg/L) marginally exceeding the SSSL (0.00115 mg/L). However, the chloroform results were flagged with a “B” data qualifier indicating that chloroform was also detected in an associated laboratory or field blank sample. Additionally, the

SVOC bis(2-ethylhexyl)phthalate was detected in two groundwater samples at concentrations exceeding the SSSL. However, bis(2-ethylhexyl)phthalate is a common laboratory contaminant and is probably not related to site activities.

The potential threat to ecological receptors is also expected to be low and is limited to metals and SVOCs in surface and depositional soils. The concentrations of three metals (cadmium, lead, and zinc) exceeded ESVs and background concentrations in a limited number of surface and depositional soil samples. In addition, six SVOCs, including three PAH compounds, exceeded ESVs in a limited number of surface and depositional soil samples. The PAH concentrations were below PAH background values. The majority of the site is a well-developed area consisting of buildings and paved road areas and is currently being used by the City of Anniston as a motor pool area. Based on the low levels and limited spatial distribution of the metals and SVOCs detected at the site, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), do not appear to have adversely impacted the environment. The metals and chemical compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse with regard to hazardous, toxic, and radioactive waste at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7).

## ***1.0 Introduction***

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The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE), Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), under Contract Number DACA21-96-D-0018, Task Order CK05. The site is hereinafter referred to as Former Motor Pool Area 3100, 23rd Street, and includes all associated parcels unless otherwise specified.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis and monitoring well installation activities, conducted at Former Motor Pool Area 3100, 23rd Street.

### ***1.1 Project Description***

Former Motor Pool Area 3100, 23rd Street was identified as an area to be investigated prior to property transfer. Former Motor Pool Area 3100, 23rd Street, was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in October 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at Former Motor Pool Area 3100, 23rd Street. The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan (SHP) and quality assurance plan (QAP).



The SI included field work to collect nine surface soil samples, twelve subsurface soil samples, nine groundwater samples, three surface water samples, three sediment samples, and two depositional soil samples to determine if potential site-specific chemicals are present at Former Motor Pool Area 3100, 23rd Street, and to provide data useful for supporting any future corrective measures and closure activities.

Because the site is located within the “Possible Explosive Ordnance Impact Area” shown on Plate 10 of the FTMC Archives Search Report, Maps (USACE, 1999), surface and subsurface unexploded ordnance (UXO) avoidance was also performed.

## **1.2 Purpose and Objectives**

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at Former Motor Pool Area 3100, 23rd Street, at concentrations that would present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team to address the occurrence of PAH compounds in surface soils as a result of anthropogenic activities at FTMC. Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide to propose “No Further Action” at the site or to conduct additional work at the site.

## **1.3 Site Description and History**

Former Motor Pool Area 3100 is located in the western portion of the FTMC Main Post, near the intersection of 23rd Street and Iron Mountain Road (Figures 1-1 and 1-2). The site covers approximately 4 acres and contains two washracks (Parcel 72[7]), an oil/water separator (OWS),

facilities for large vehicle maintenance, a fuel pump island, a vehicle maintenance ramp (grease rack), and a large parking/staging area for vehicles. The motor pool washracks (Facilities 3146 and 3147) were built in the 1950s and originally had a baffle-type OWS. These facilities were rebuilt in 1991 with a settling basin attached to a coalescing plate OWS that discharges to the sanitary sewer system (ESE, 1998). Three underground storage tanks (UST) are located at this site: two 10,000-gallon diesel fuel USTs (Parcel 27[7]) and a 2,000-gallon, steel waste oil UST (Parcel 28[7]). The 2,000-gallon waste oil UST located at the grease rack (Facility 3148) was closed in place (abandoned) in 1994 and replaced with a 2,000-gallon fiberglass UST (ESE, 1998). The site is currently being used by the City of Anniston as a motor pool area.

The site elevation is approximately 795 feet above mean sea level. Remount Creek is located just to the east of the site and flows north-northeast.

## ***2.0 Previous Investigations***

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An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC

employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels. Previous investigations have been conducted at Former Motor Pool Area 3100, 23rd Street, as described below.

The 2,000-gallon steel waste oil UST (Parcel 28[7]) located south of the grease rack (Facility 3148) and west of the flammable storage shed was closed in place on May 5, 1994 (Figure 2-1) (Braun Intertec Corporation [Braun], 1995). The UST was abandoned in place because it was located too close to the grease rack footers to be excavated and removed. The tank was filled in place with 11 cubic yards of concrete. The abandoned UST was replaced with a 2,000-gallon UST that was installed on the north side of the grease rack (Figure 2-1).

Soil samples were collected from soil borings placed on the north, east, and west sides of the abandoned UST. Samples were also collected from beneath the aboveground waste oil piping extending from the grease rack to the UST. The three soil borings were advanced to 8 feet below ground surface (bgs) and one sample was collected from each soil boring at a depth of approximately 7.5 feet. This depth was assumed to be at the bottom of the UST. A fourth soil boring could not be placed on the south side because of the close proximity of the fence. According to the closure report, access was not available to the outside of the fence in that area. The soil samples were analyzed for total petroleum hydrocarbons (TPH) and total lead, as summarized in Table 2-1. Groundwater was encountered at 6 feet bgs in the three soil borings; however, groundwater sampling was not conducted (Braun, 1995).

The north side soil sample had TPH concentrations below the reporting limit (RL) and the ADEM action limit of 100 parts per million. The east and west samples had TPH concentrations above the RL but below the action limit. The shallow soil sample collected from beneath the aboveground waste oil piping contained elevated TPH concentrations relative to the deeper soil sample at the same location (Table 2-1). A surface spill observed below the aboveground piping is suspected to be the source of elevated TPH levels in the soil beneath the piping (Braun, 1995). The closure report indicates that soil was not removed from the UST site (Braun, 1995).

There were not any other investigations identified for Former Motor Pool Area 3100, 23rd Street. The site was identified as a Category 7 CERFA site: a parcel where petroleum products were stored, and possibly released onto the site or to the environment, and/or were disposed on site property. The site lacked adequate documentation and, therefore, required additional evaluation to determine the environmental condition of the parcel.

**Table 2-1**

**Sample Data for the Closed-In-Place 2,000-Gallon Waste Oil UST  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

Sampling Task	Sample Number	Sample Location/ Description	Sample Date	Vertical Sample Depth (feet)	Analytical Parameters	
					Total Lead (ppm)	TPH (ppm)
<b>Samples collected at UST abandonment</b>	94-0431-06	Boring 3148-W	4/25/1994	7.5	11	15
	94-0431-07	Boring 3148-N	4/25/1994	7.5	12	< 5
	94-0506-03	Boring 3148-E	5/20/1994	7.5	15	10
	94-0506-01	Pipe trench "A"	5/20/1994	0.5	39	9000
	94-0506-02	Pipe trench "B"	5/20/1994	2.5	11	520

Source: Braun Intertec Corporation (Braun) 1995, *UST Closure, Site Assessment Report, Fort McClellan, Bldg. 3148, Anniston, Alabama (15)*, January.

ppm - Parts per million.

TPH - Total petroleum hydrocarbons (EPA Method 418.1).

UST - Underground storage tank.

## **3.0 Current Site Investigation Activities**

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This chapter summarizes SI activities conducted by IT at Former Motor Pool Area 3100, 23rd Street, including UXO avoidance, environmental sampling and analysis, and groundwater monitoring well installation activities.

### **3.1 UXO Avoidance**

UXO avoidance was performed at Former Motor Pool Area 3100, 23rd Street, following methodology outlined in Section 4.1.7 of the SAP (IT, 2000a). IT UXO personnel used a Schonstedt Heliflux Magnetic Locator to perform a surface sweep of the parcel prior to site access. After the parcel was cleared for access, sample locations were cleared using a Foerster Ferex Electromagnetic Detector following procedures outlined in Section 4.1.7.3 of the SAP (IT, 2000a).

### **3.2 Environmental Sampling**

The environmental sampling performed during the SI at Former Motor Pool Area 3100, 23rd Street, included the collection of surface soil samples, depositional soil samples, subsurface soil samples, surface water samples, sediment samples, and groundwater samples for chemical analysis. The sample locations were determined by observing site physical characteristics noted during a site walkover, by reviewing historical documents pertaining to activities conducted at the site, and based on UXO avoidance activities. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.4.

#### **3.2.1 Surface and Depositional Soil Sampling**

Surface soil samples were collected from nine locations and depositional soil samples were collected from two locations at Former Motor Pool Area 3100, 23rd Street, as shown on Figure 3-1. Soil sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based on UXO avoidance activities, sampling rationale, presence of surface structures, site topography, and buried utilities.

**Sample Collection.** Surface and depositional soil samples were collected from the upper 1 foot of soil by either direct-push technology or with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface and

Table 3-1

**Sampling Locations and Rationale**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
FTA-147-GP01	Surface Soil Groundwater	Surface soil and groundwater samples were collected adjacent to north side of fuel island east of Building 3139.
FTA-147-GP02	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected adjacent to south side of fuel island east of Building 3139.
FTA-147-GP03	Subsurface Soil	A subsurface soil sample was collected adjacent to east side of the diesel fuel underground storage tank (UST), located outside the fence.
FTA-147-GP04	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected outside the fence and south of the flammable storage shed near the grease rack (3148).
FTA-147-GP05	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected southwest of Washrack 3147 and the oil/water separator (OWS) in expected groundwater flow direction from OWS and washrack.
FTA-147-GP07	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected on the northwest side of Washrack 3147 and the OWS in expected groundwater flow direction from OWS and washrack.
FTA-147-GP08	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected through asphalt near northeast corner of the fenced area where obvious oil stain exists.
FTA-147-GP09(SS) FTA-147-GP09(W)	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected southeast of Washrack 3146 and the oil/water separator hydraulically downgradient from OWS and washrack.
FTA-147-GP10(SS) FTA-147-GP10(W)	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected adjacent to the closed-in-place waste oil UST located south of the grease rack (3148).
FTA-147-GP11	Surface Soil Groundwater	Surface soil and groundwater samples were collected through asphalt east of Building 3139 and in front of the rollup door at south end of the building.
FTA-147-GP12	Subsurface Soil	A subsurface soil sample was collected adjacent (north) to the diesel fuel USTs, located outside the fence.
FTA-147-GP13	Subsurface Soil	A subsurface soil sample was collected adjacent (north) to the fuel diesel USTs, located outside the fence.
FTA-147-GP14	Subsurface Soil	A subsurface soil sample was collected adjacent (west) to the diesel fuel USTs, located outside the fence.
FTA-147-GP15	Subsurface Soil	A subsurface soil sample was collected through asphalt adjacent (north) to the closed-in-place waste oil UST, near the grease rack.
FTA-147-SW/SD01	Surface Water Sediment	Surface water and sediment samples were collected from a location that is a depositional sink near the southwest corner of the site.
FTA-147-SW/SD02	Surface Water Sediment	Surface water and sediment samples were collected from Remount Creek located just east (downgradient) of the site.
FTA-147-DEP01	Depositional Soil	A depositional soil sample was collected from a depositional sink area along the eastern boundary of the site and into the wooded area to the east.
FTA-147-DEP02	Depositional Soil	A depositional soil sample was collected from a depositional sink area near the northeast corner of the site and into the wooded area to the east.
WS-147-SW/SD01	Surface Water Sediment	Surface water and sediment samples were collected within a tributary to Remount Creek, upstream (southwest) of Parcel 147(7) to provide data representative of upgradient baseline conditions.

Table 3-2

**Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Samples  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-147-GP01	FTA-147-GP01-SS-EG0001-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP02	FTA-147-GP02-SS-EG0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP02-DS-EG0004-REG	10-12				
FTA-147-GP03	FTA-147-GP03-DS-EG0005-REG	3-5				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP04	FTA-147-GP04-SS-EG0006-REG	0-1	FTA-147-GP04-SS-EG0007-FD	FTA-147-GP04-SS-EG0008-FS		TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP04-DS-EG0009-REG	2-4				
FTA-147-GP05	FTA-147-GP05-SS-EG0010-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP05-DS-EG0011-REG	3-5				
FTA-147-GP07	FTA-147-GP07-SS-EG0013-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP07-DS-EG0014-REG	4-6				
FTA-147-GP08	FTA-147-GP08-SS-EG0015-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP08-DS-EG0016-REG	4-6				
FTA-147-GP09(SS)	FTA-147-GP09-SS-EG0017-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP09-DS-EG0018-REG	8-10				
FTA-147-GP10(SS)	FTA-147-GP10-SS-EG0029-REG	0-1	FTA-147-GP10-DS-EG0020-FD			TCL VOCs, TCL SVOCs, TAL Metals
	FTA-147-GP10-DS-EG0019-REG	4-6				
FTA-147-GP11	FTA-147-GP11-SS-EG0021-REG	0-1			FTA-147-GP11-SS-EG0021-MS FTA-147-GP11-SS-EG0021-MSD	TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP12	FTA-147-GP12-DS-EG0023-REG	9-11				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP13	FTA-147-GP13-DS-EG0024-REG	10-12				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP14	FTA-147-GP14-DS-EG0025-REG	4-5				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP15	FTA-147-GP15-DS-EG0026-REG	4-6				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-DEP01	FTA-147-DEP01-DEP-EG0027-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-DEP02	FTA-147-DEP02-DEP-EG0028-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals

FD - Field duplicate.

FS - Field split.

ft. bgs - feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.



depositional soil samples were collected by first removing surface debris, such as rocks and vegetation, from the immediate sample area. The soil was then collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for volatile organic compound (VOC) analysis were collected directly from the sampler with three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.4. Sample collection logs are included in Appendix A.

### **3.2.2 Subsurface Soil Sampling**

Subsurface soil samples were collected from 12 soil borings at Former Motor Pool Area 3100, 23rd Street, as shown on Figure 3-1. Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on UXO avoidance activities, sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

**Sample Collection.** Subsurface soil samples were collected from soil borings at depths greater than 1 foot bgs in the unsaturated zone. The soil borings were advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.4.

Soil samples were collected continuously to 12 feet bgs or until direct-push sampler refusal was encountered. Subsurface soil samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest sample interval above the saturated zone was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the sampler with three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analyses are summarized in Table 3-2. The on-site geologist constructed a detailed boring log for each soil boring. The lithological log for each borehole is included in Appendix B.

At the completion of soil sampling, boreholes were abandoned with hydrated bentonite chips following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

### **3.2.3 Well Installation**

Nine temporary wells were installed in the residuum groundwater zone at Former Motor Pool Area 3100, 23rd Street to collect groundwater samples for laboratory analyses. The well/groundwater sampling locations are shown on Figure 3-1. Table 3-3 summarizes construction details of the wells installed at Former Motor Pool Area 3100, 23rd Street. The well construction logs are included in Appendix B.

IT contracted Miller Drilling, Inc., to install the temporary wells with a hollow-stem auger rig at the locations shown on Figure 3-1. IT attempted to install the temporary wells at the direct-push soil boring locations. However, this was not possible at two locations (FTA-147-GP09 and FTA-147-GP10) because of rig access issues and overhead and underground utilities. Therefore, at these locations the temporary well was offset approximately 15 to 20 feet from the soil boring location. The soil sampling location was identified with “(SS)” and the associated temporary well location was identified with “(W)”. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch inside diameter (ID) hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The borehole was augered to the depth of direct-push sampler refusal and samples were collected at the depth of direct-push refusal to the bottom of the borehole. A 2-foot-long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where split-spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes continued the lithological log for each borehole from the depth of split-spoon sampler refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geological and hydrogeologic information. The lithological log for each borehole is included in Appendix B.

Upon reaching the target depth at each borehole, a 10- or 15-foot length of 2-inch ID, 0.010-inch factory-slotted, Schedule 40 polyvinyl chloride (PVC) screen with a 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A sand pack consisting of number 1 filter sand

**Table 3-3**

**Temporary Well Construction Summary  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Temporary Well</b>	<b>Northing</b>	<b>Easting</b>	<b>Ground Elevation (ft msl)</b>	<b>TOC Elevation (ft msl)</b>	<b>Well Depth (ft bgs)</b>	<b>Screen Length (ft)</b>	<b>Screen Interval (ft bgs)</b>	<b>Well Material</b>
FTA-147-GP01	1166397.92	665380.97	794.62	794.22	21.0	15	5.75 - 20.75	2" ID Sch. 40 PVC
FTA-147-GP02	1166371.84	665337.56	794.84	794.49	19.0	15	3.75 - 18.75	2" ID Sch. 40 PVC
FTA-147-GP04	1166160.17	665358.99	793.90	797.01	14.0	10	3.75 - 13.75	2" ID Sch. 40 PVC
FTA-147-GP05	1166182.83	665457.57	792.96	795.02	13.5	10	3.25 - 13.25	2" ID Sch. 40 PVC
FTA-147-GP07	1166251.93	665463.69	794.39	794.21	27.0	15	11.75 - 26.75	2" ID Sch. 40 PVC
FTA-147-GP08	1166456.32	665531.13	791.91	791.70	21.0	15	5.75 - 20.75	2" ID Sch. 40 PVC
FTA-147-GP09(W)	1166212.42	665580.38	790.87	791.16	24.0	15	8.75 - 23.75	2" ID Sch. 40 PVC
FTA-147-GP10(W)	1166172.22	665311.25	795.32	795.65	27.0	15	11.75 - 26.75	2" ID Sch. 40 PVC
FTA-147-GP11	1166296.07	665251.09	796.45	796.09	21.0	15	5.75 - 20.75	2" ID Sch. 40 PVC

Temporary wells installed with an auger drill rig using a 4.25-inch inside diameter hollow-stem auger.

Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum (NAD83), 1983.

Elevations were referenced to the North American Vertical Datum of 1988 (NAVD88).

2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.

bgs - Below ground surface.

ft - Feet.

msl - Mean sea level.

TOC - Top of casing.

(environmentally safe, clean fine sand, sieve size 20 to 40) was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged approximately 10 minutes using a solid PVC surge block, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite pellets, was placed immediately on top of the sand pack and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite pellets were allowed to hydrate in the groundwater. The bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). A locking well cap was placed on the PVC well casing. The temporary well surface completion included attaching plastic sheeting around the PVC riser using duct tape. Additionally, sand bags were used to secure the sheeting to the ground surface around the temporary well.

The temporary wells were developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to re-establish the natural hydraulic flow conditions. Development continued until the water turbidity was equal to or less than 20 nephelometric turbidity units or for a maximum of 4 hours. The well development logs are included in Appendix C.

#### **3.2.4 Water Level Measurements**

The depth to groundwater was measured in the temporary wells installed at Former Motor Pool Area 3100, 23rd Street on March 14, 2000 following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned between use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurements were referenced to the top of the PVC casing. A summary of groundwater level measurements is presented in Table 3-4.

#### **3.2.5 Groundwater Sampling**

Groundwater sample were collected from the nine temporary wells installed at Former Motor Pool Area 3100, 23rd Street at the locations shown on Figure 3-1. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5.

**Table 3-4**

**Groundwater Elevations**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

<b>Well Location</b>	<b>Date</b>	<b>Depth to Water (ft BTOC)</b>	<b>Ground Elevation (ft msl)</b>	<b>Top of Casing Elevation (ft msl)</b>	<b>Groundwater Elevation (ft msl)</b>
FTA-147-GP01	14-Mar-00	4.43	794.62	794.22	789.79
FTA-147-GP02	14-Mar-00	4.33	794.84	794.49	790.16
FTA-147-GP04	14-Mar-00	6.39	793.90	797.01	790.62
FTA-147-GP05	14-Mar-00	5.47	792.96	795.02	789.55
FTA-147-GP07	14-Mar-00	4.79	794.39	794.21	789.42
FTA-147-GP08	14-Mar-00	7.85	791.91	791.70	783.85
FTA-147-GP09(W)	14-Mar-00	3.00	790.87	791.16	788.16
FTA-147-GP10(W)	14-Mar-00	4.15	795.32	795.65	791.50
FTA-147-GP11	14-Mar-00	6.08	796.45	796.09	790.01

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

BTOC - Below top of casing.

ft - Feet.

msl - Mean sea level.

**Table 3-5**

**Groundwater Sample Designations and QA/QC Samples  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	QA/QC Samples			Analytical Suite
		Field Duplicates	Field Splits	MS/MSD	
FTA-147-GP01	FTA-147-GP01-GW-EG3001-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP02	FTA-147-GP02-GW-EG3002-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP04	FTA-147-GP04-GW-EG3003-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP05	FTA-147-GP05-GW-EG3006-REG	FTA-147-GP05-GW-EG3004-FD	FTA-147-GP05-GW-EG3005-FS		TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP07	FTA-147-GP07-GW-EG3008-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP08	FTA-147-GP08-GW-EG3009-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP09(W)	FTA-147-GP09-GW-EG3010-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP10(W)	FTA-147-GP10-GW-EG3011-REG				TCL VOCs, TCL SVOCs, TAL Metals
FTA-147-GP11	FTA-147-GP11-GW-EG3012-REG			FTA-147-GP11-GW-EG3012-MS FTA-147-GP11-GW-EG3012-MSD	TCL VOCs, TCL SVOCs, TAL Metals

Groundwater samples were collected from the approximate midpoint of the saturated screened interval of the monitoring well.

FD - Field duplicate.

FS - Field split.

ft bgs - Feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

N/A - Not applicable.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

**Sample Collection.** Groundwater sampling was performed following procedures outlined in Section 4.9.1.4 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum of three well volumes and after field parameters (i.e., temperature, pH, dissolved oxygen, specific conductivity, oxidation-reduction potential, and turbidity) stabilized. Purging and sampling were performed with a peristaltic pump equipped with Teflon<sup>™</sup> tubing. Field parameters were measured using a calibrated water quality meter. Field parameter readings are summarized in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.4.

### **3.2.6 Surface Water Sampling**

Three surface water samples were collected at Former Motor Pool Area 3100, 23rd Street at the locations shown on Figure 3-1. The surface water sampling locations and rationale are listed in Table 3-1. The surface water sample designations and QA/QC samples are listed in Table 3-7. Surface water samples with a “WS” prefix were collected as part of the watershed screening assessment conducted at FTMC to characterize the general quality of FTMC surface water bodies and to determine whether they attain State designated use criteria (IT, 1998c). The sampling locations were determined in the field, based on drainage pathways and actual field observations.

**Sample Collection.** Surface water samples were collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). The surface water samples were collected by dipping a clean stainless-steel pitcher in the water and pouring the water in the appropriate sample containers. Surface water samples were collected after the field parameters described in Section 3.2.5 had been measured using a calibrated water quality meter. The field parameter readings are presented in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.4.

### **3.2.7 Sediment Sampling**

Three sediment samples were collected at the same locations as the surface water samples, as shown on Figure 3-1. Sediment sampling locations and rationale are presented in Table 3-1. The sediment sample designations and QA/QC samples are listed in Table 3-7. Sediment samples with a “WS” prefix were collected as part of the watershed screening assessment conducted at FTMC to characterize the general quality of FTMC surface water bodies and to determine whether they attain State designated use criteria (IT, 1998c). The sediment sampling locations were determined in the field, based on drainage pathways and actual field observations.

**Table 3-6**

**Groundwater and Surface Water Field Parameters  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Sample Location</b>	<b>Date</b>	<b>Media</b>	<b>Specific Conductivity (mS/cm)<sup>a</sup></b>	<b>Dissolved Oxygen (mg/L)</b>	<b>ORP (mV)</b>	<b>Temperature (°C)</b>	<b>Turbidity (NTU)</b>	<b>pH (SU)</b>
FTA-147-GP01	25-JAN-99	GW	0.268	4.02	296	19.46	0.0	5.05
FTA-147-GP02	25-JAN-99	GW	0.016	1.02	311	18.32	0.0	4.78
FTA-147-GP04	25-JAN-99	GW	0.024	3.96	266	15.29	0.0	5.16
FTA-147-GP05	26-JAN-99	GW	0.028	7.36	266	12.19	0.0	5.60
FTA-147-GP07	22-JAN-99	GW	0.033	1.44	174	19.30	5.3	5.32
FTA-147-GP08	22-JAN-99	GW	0.061	5.07	234	20.55	0.0	5.88
FTA-147-GP09(W)	26-JAN-99	GW	0.109	6.09	97	16.14	0.0	6.43
FTA-147-GP10(W)	22-JAN-99	GW	0.057	5.21	82	21.70	27.8	5.81
FTA-147-GP11	22-JAN-99	GW	0.087	3.16	39	20.95	29.5	5.72
FTA-147-SW/SD01	08-FEB-99	SW	0.248	6.82	227	14.33	3.6	5.72
FTA-147-SW/SD02	08-FEB-99	SW	0.253	6.08	272	13.03	0.1	5.98
WS-147-SW/SD01	08-FEB-99	SW	0.241	3.86	212	10.41	12.6	5.82

<sup>a</sup>Specific conductivity values standardized to millisiemens per centimeter.

°C - Degrees Celsius.

GW - Groundwater.

mg/L - Milligrams per liter.

mS/cm - Millisiemens per centimeter.

mV - Millivolts.

NTU - Nephelometric turbidity units.

ORP - Oxidation-reduction potential.

SU - Standard units.

SW - Surface water.



**Table 3-7**

**Surface Water and Sediment Sample Designations and QA/QC Samples  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-147-SW/SD01	FTA-147-SW/SD01-SW-EG2001-REG FTA-147-SW/SD01-SD-EG1001-REG	NA 0-0.5	FTA-147-SW/SD01-SD-EG1002-FD			TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size (sediment only)
FTA-147-SW/SD02	FTA-147-SW/SD02-SW-EG2002-REG  FTA-147-SW/SD02-SD-EG1003-REG	NA  0-0.5			FTA-147-SW/SD02-SW-EG2002-MS FTA-147-SW/SD02-SW-EG2002-MSD	TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size (sediment only)
WS-147-SW/SD01	WS-147-SW/SD01-SW-WS2003-REG WS-147-SW/SD01-SD-WS1003-REG	NA 0-0.5				TCL VOCs, TCL SVOCs, TAL Metals, TOC, Grain Size (sediment only)

FD - Field duplicate.

FS - Field split.

ft. bgs - Feet below ground surface.

MS/MSD - Matrix spike/matrix spike duplicate.

NA - Not applicable.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

**Sample Collection.** Sediment samples were collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP (IT, 2000a). The sediment samples were collected with a stainless-steel spoon and placed in a stainless-steel bowl. Samples for VOC analysis were then immediately collected from the bowl with three EnCore® samplers. The remaining portion of the sample was homogenized and placed in the appropriate sample containers. Sample collection logs are included in Appendix A. The sediment samples were analyzed for the parameters listed in Table 3-7 using methods outlined in Section 3.4.

### **3.3 Surveying of Sample Locations**

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a), and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

### **3.4 Analytical Program**

Samples collected during the SI were analyzed for various chemical and physical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Samples collected at Former Motor Pool Area 3100, 23rd Street, were analyzed for the following parameters:

- Target compound list VOCs - EPA Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) - EPA Method 8270C
- Target analyte list metals - EPA Method 6010B/7000
- Total organic carbon (TOC) - EPA Method 9060 (sediment only)
- Grain size - American Society for Testing and Materials D421/D422 (sediment only).

The samples were analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A

summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

### ***3.5 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custody records were recorded as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to USACE South Atlantic Division Laboratory in Marietta, Georgia.

### ***3.6 Investigation-Derived Waste Management and Disposal***

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at Former Motor Pool Area 3100, 23rd Street was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined rolloff bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analyses. Based on the results, drill cuttings and personal protective equipment generated during the SI at Former Motor Pool Area 3100, 23rd Street were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

### **3.7 Variances/Nonconformances**

#### **3.7.1 Variances**

Four variances to the SFSP were recorded during completion of the SI at Former Motor Pool Area 3100, 23rd Street. The variances did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1998a). The variances to the SFSP are summarized in Table 3-8 and included in Appendix G.

#### **3.7.2 Nonconformances**

One nonconformance to the SFSP was recorded during completion of the SI at Former Motor Pool Area 3100, 23rd Street. The nonconformance to the SFSP is summarized in Table 3-8 and included in Appendix G.

### **3.8 Data Quality**

The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and QAP; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A. As discussed in Section 3.7, there were four variances and one nonconformance to the SFSP. However, the variances did not impact the usability of the data.

**Data Validation.** A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System™ database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs. Rejected data (assigned an “R” qualifier) were not used in the comparison to the SSSLs and ESVs.

The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

**Table 3-8**

**Variances and Nonconformance to the Site-Specific Field Sampling Plan  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Variance to the SFSP</b>	<b>Justification for Variance</b>	<b>Impact to Site Investigation</b>
Direct-push temporary wells not installed: FTA-147-GP01, FTA-147-GP04, FTA-147-GP05, FTA-147-GP06, FTA-147-GP07, FTA-147-GP08, FTA-147-GP09, and FTA-147-GP11.	Groundwater was not encountered during direct-push drilling.	Drilling with hollow-stem augers produced enough groundwater to accomplish development and sampling of the wells.
Collected surface soil sample at FTA-147-GP10.	Surface soil was collected at FTA-147-GP10 due to visible petroleum stain on ground surface.	Collection of a surface soil sample allowed for more accurate determination of potential contamination at the site.
Groundwater sample was not collected from direct-push temporary well FTA-147-GP02.	Groundwater was not present in well at time of sampling.	Drilling with hollow-stem auger rig allowed well completion for development and sampling.
Temporary well FTA-147-GP10 was moved approximately 15 feet east of the direct-push soil boring FTA-147-GP10 location.	Temporary well FTA-147-GP10 was installed 15 feet east of soil boring FTA-147-GP10 because buried underground utility lines were present.	Moving temporary well FTA-147-GP10 15 feet east of FTA-147-GP10 soil boring allowed well completion for development and sampling.
<b>Nonconformance to the SFSP</b>	<b>Justification for Nonconformance</b>	<b>Impact to Site Investigation</b>
Subsurface soil samples not collected: FTA-147-GP01, FTA-147-GP06, and FTA-147-GP11.	Three offsets were conducted but ferromagnetic anomalies were encountered at approximately 2 feet below ground surface.	Data quality objectives would not be met by other site samples. Relocating sample FTA-147-GP01, FTA-147-GP06, and FTA-147-GP11 would not achieve data quality objectives.

## **4.0 Site Characterization**

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Subsurface investigations performed at Former Motor Pool Area 3100, 23rd Street, provided soil, geologic, and groundwater data used to characterize the geology and hydrogeology of the site.

### **4.1 Regional and Site Geology**

#### **4.1.1 Regional Geology**

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold and thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold and thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group is comprised of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984), but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-grey siltstone and mudstone. Massive to laminated, greenish-grey and black mudstone makes up the Nichols Formation with thin interbeds of

siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appear to dominate the unit and consists primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consists of sandy and micaceous shale and silty, micaceous mudstone which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded

to laminated, siliceous dolomite and dolomitic limestone that weathers to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian Age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.



The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence comprising the Eden thrust sheet is exposed at FTMC through an eroded “window” or “fenster” in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned, and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

#### **4.1.2 Site Geology**

Soils at Former Motor Pool Area 3100, 23rd Street, fall into the Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded (AcB2). This mapping unit consists of friable soils that have developed in old alluvium on foot slopes and along the base of mountains. The color of the surface soil ranges from very dark brown and dark brown to reddish brown and dark reddish brown. The texture of subsoil ranges from light clay loam to clay or silty clay loam. The alluvium ranges in thickness from 2 feet to more than 8 feet. Infiltration and runoff are medium, permeability is moderate, and the capacity for available moisture is high. Organic matter is moderately low (U.S. Department of Agriculture, 1961).

Former Motor Pool Area 3100, 23rd Street, is situated near the western boundary of the Ordovician window in the uppermost thrust sheet with a splay of the Pell City Fault extending along Iron Mountain Road, just west of the site (Figure 4-1). An anticlinal structure associated with the Appalachian fold and thrust structure belt borders the parcel to the south-southeast. Bedrock beneath the site is mapped as Ordovician Little Oak and Newala limestones. The Cambrian Shady Dolomite underlies the area west of Iron Mountain Road (Figure 4-1) and is an area of high relief. In addition, bedrock of the Chilhowee Group underlies the area southeast of the site. Sandstone and quartzite rock fragments present within the residuum at the site likely have been derived from these areas.

A geologic cross section was constructed using the direct-push and hollow-stem auger boring data collected during the SI and is presented on Figure 4-2. The geologic cross section location is shown on Figure 3-1. Based on the cross section, residuum beneath Former Motor Pool Area

3100, 23rd Street, consists of predominantly silt and clay with sandstone and quartzite rock fragments and lenses of sand. Direct-push refusal was encountered at depths ranging from 2 to 13 feet bgs. Competent bedrock was not encountered during drilling.

## **4.2 Site Hydrology**

### **4.2.1 Surface Hydrology**

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates. The major surface water features at the Main Post of FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Surface runoff at Former Motor Pool Area 3100, 23rd Street, flows east towards Remount Creek, which is located east of the site and flows to the north-northeast.

### **4.2.2 Hydrogeology**

Static groundwater levels were measured in the temporary wells installed at the site on March 14, 2000, as summarized in Table 3-4. A groundwater elevation map was constructed using the March 2000 data, as shown on Figure 4-3. Groundwater flow at the site is generally to the east-northeast towards Remount Creek. This suggests that the area is hydraulically connected to the creek. The hydraulic gradient across the site was calculated to be approximately 0.02 feet per foot between FTA-147-GP10(W) and FTA-147-GP08.

During soil boring and well installation activities, groundwater was generally encountered in clay residuum at depths ranging from approximately 7 feet bgs at FTA-147-GP02 to 25 feet bgs at FTA-147-GP09(W). Static groundwater levels summarized in Table 3-4 range from approximately 5 feet to 23 feet above the depth to water data from the boring logs for FTA-147-GP02 and FTA-147-GP09(W), respectively (Appendix B). This indicates that the groundwater has an upward hydraulic gradient and is under semiconfined conditions.

## **5.0 Summary of Analytical Results**

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The results of the chemical analyses of samples collected at Former Motor Pool Area 3100, 23rd Street, indicate that metals, VOCs, and SVOCs have been detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix H. Additionally, SVOC (PAH compounds) concentrations in surface and depositional soils that exceeded SSSLs and ESVs were compared to PAH background screening values. The PAH background screening values were derived from PAH analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for 2 categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are the more conservative (i.e., lower) of the PAH background values and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), including 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields an RL of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has an RL of 0.330 mg/kg, which is typical for a soil matrix sample. Because of the direct nature of the Method 8260B analysis and its resulting lower RL, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however, when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination,

precision, or accuracy indicator anomalies were encountered. The validation qualifiers and concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more accurate result.

The following sections and Tables 5-1 through 5-5 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

### **5.1 Surface and Depositional Soil Analytical Results**

Nine surface soil samples and two depositional soil samples were collected for chemical analyses at Former Motor Pool Area 3100, 23rd Street. Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and PAHs), as presented in Table 5-1.

**Metals.** Eighteen metals were detected in surface and depositional soil samples collected at Former Motor Pool Area 3100, 23rd Street. Sample location FTA-147-GP05 contained seventeen of the eighteen detected metals and three other locations (FTA-147-DEP01, FTA-147-GP04, and FTA-147-GP09) each contained sixteen of the eighteen detected metals. Four of the zinc results were flagged with a “B” data qualifier signifying that this metal was also detected in an associated laboratory or field blank sample.

The concentrations of aluminum (FTA-147-GP04 and FTA-147-GP07), arsenic (ten locations), cadmium (FTA-147-DEP01 and FTA-147-DEP02), chromium (five locations), iron (eleven locations), and manganese (six locations) exceeded residential human health SSSLs. However with the exception of the cadmium results (FTA-147-DEP01 and FTA-147-DEP02), the detected metals concentrations were below their respective background concentration or within the range of background values determined by SAIC (1998) (Appendix H).

The following metals were detected at concentrations exceeding ESVs and their respective background concentration: cadmium (FTA-147-DEP01 and FTA-147-DEP02), chromium (three locations), iron (one location), lead (four locations), selenium (FTA-147-GP07), and zinc (four locations). With the exceptions of cadmium (2 locations), lead (4 locations), and zinc (2 locations), the concentrations of these metals were within the range of background values.

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-147 FTA-147-DEP01 EG0027 11-Nov-98 0- 1					FTA-147 FTA-147-DEP02 EG0028 11-Nov-98 0- 1					FTA-147 FTA-147-GP01 EG0001 15-Oct-98 0- 1					FTA-147 FTA-147-GP02 EG0003 15-Oct-98 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	
METALS																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	5.26E+03				YES	1.70E+03				YES	3.28E+03				YES	4.71E+03				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	5.00E+00			YES		ND					2.20E+00			YES		2.30E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	5.77E+01					6.74E+01					2.36E+01					2.94E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					ND					ND				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	1.64E+01		YES	YES	YES	1.01E+01		YES	YES	YES	ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	3.46E+04		YES			1.42E+05		YES			2.60E+03		YES			8.63E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	4.84E+01		YES	YES	YES	9.71E+01		YES	YES	YES	8.10E+00				YES	8.20E+00				
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	9.80E+00					ND					ND					5.80E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	3.66E+01		YES			1.77E+01		YES			4.30E+00 J					4.30E+00 J				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.44E+04			YES	YES	5.86E+03			YES	YES	8.87E+03			YES	YES	9.91E+03			YES	
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.66E+02		YES		YES	3.54E+02		YES		YES	4.80E+00					6.60E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	1.84E+04		YES			7.37E+04		YES			1.26E+03		YES			ND				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	2.38E+02				YES	1.28E+02				YES	1.78E+02				YES	2.56E+02				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	4.90E-02					6.80E-02					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	1.15E+01		YES			ND					ND					ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.98E+01				YES	2.19E+01				YES	7.20E+00 J				YES	7.10E+00 J				
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	3.55E+02		YES		YES	1.56E+02		YES		YES	9.10E+00 B					1.04E+01 B				
VOLATILE ORGANIC COMPOUNDS																								
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	1.70E-02 B					ND					ND					ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	6.50E-03 J					ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.00E-01 J					9.80E-03 B					2.80E-01 J					4.60E-02 B				
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	4.00E-03 B					5.70E-03 B					2.80E-03 B					2.30E-03 B				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					3.30E-03 J					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																								
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					6.60E-02 J					ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	4.40E-02 J					4.80E-02 J					6.40E-02 J					3.30E-02 J				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	1.00E-01 J			YES	YES	ND					3.00E-02 J					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	1.70E-01 J					ND					8.10E-02 J					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	1.10E-01 J					7.00E-02 J					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.20E-01 J					ND					6.30E-02 J					ND				
Butyl benzyl phthalate	mg/kg	NA	1.56E+03	2.40E-01	7.20E-02 J					1.10E-01 J					ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					ND					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	1.20E-01 J					1.10E-01 J					8.40E-02 J					5.30E-02 J				
Di-n-octyl phthalate	mg/kg	NA	1.56E+02	7.09E+02	5.20E-01					1.70E+00 J					ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	6.20E-02 J					7.40E-02 J					1.50E-01 J				YES	1.10E-01 J				
Hexachlorobenzene	mg/kg	NA	3.93E-01	2.50E-03	ND					7.20E-02 J				YES	ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	9.90E-02 J					7.50E-02 J					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					7.60E-02 J					ND					6.30E-02 J				
Phenol	mg/kg	NA	4.66E+03	5.00E-02	ND					3.20E-01 J				YES	ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	9.00E-02 J					1.50E-01 J				YES	1.40E-01 J				YES	8.00E-02 J				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	1.00E+00			YES		1.80E+00 B				YES	ND					2.80E-01 J				

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	>ESV
<b>METALS</b>					
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	
Calcium	mg/kg	1.72E+03	NA	NA	
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	
<b>VOLATILE ORGANIC COMPOUNDS</b>					
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	
Acetone	mg/kg	NA	7.76E+02	2.50E+00	
Bromomethane	mg/kg	NA	1.09E+01	NA	
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	
Toluene	mg/kg	NA	1.55E+03	5.00E-02	
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	
p-Cymene	mg/kg	NA	1.55E+03	NA	
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>					
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	
Butyl benzyl phthalate	mg/kg	NA	1.56E+03	2.40E-01	
Carbazole	mg/kg	NA	3.11E+01	NA	
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	
Di-n-octyl phthalate	mg/kg	NA	1.56E+02	7.09E+02	
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	YES
Hexachlorobenzene	mg/kg	NA	3.93E-01	2.50E-03	
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	
Phenol	mg/kg	NA	4.66E+03	5.00E-02	
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 3 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-147 FTA-147-GP04 EG0006 29-Oct-98 0- 1					FTA-147 FTA-147-GP05 EG0010 29-Oct-98 0- 1					FTA-147 FTA-147-GP07 EG0013 14-Oct-98 0- 1					FTA-147 FTA-147-GP08 EG0015 14-Oct-98 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	
METALS																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	8.67E+03			YES	YES	6.61E+03				YES	1.02E+04			YES	YES	5.36E+03				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	4.10E+00			YES		5.30E+00			YES		1.27E+01			YES	YES	3.90E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	1.36E+02		YES			9.27E+01					7.98E+01					4.39E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	9.90E-01		YES			6.90E-01					9.00E-01	J	YES			5.60E-01	J			
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	7.90E-01		YES			1.40E+00		YES			ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	2.92E+03		YES			3.58E+03		YES			2.06E+03		YES			2.56E+04		YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	2.36E+01			YES	YES	2.87E+01			YES	YES	6.30E+01		YES	YES	YES	1.76E+01				
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.27E+01					1.31E+01					1.48E+01					6.00E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	1.36E+01		YES			1.61E+01		YES			1.14E+01	J				6.60E+00	J			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.44E+04			YES	YES	1.48E+04			YES	YES	4.23E+04		YES	YES	YES	1.55E+04			YES	
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.03E+02	J	YES		YES	1.33E+02	J	YES		YES	1.76E+01					6.70E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	9.42E+02					1.20E+03		YES			1.13E+03		YES			1.11E+04		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	9.81E+02			YES	YES	1.06E+03			YES	YES	8.03E+02			YES	YES	3.14E+02				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					4.10E-02					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	9.80E+00	J				6.20E+00					6.30E+00					ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					1.10E+00		YES		YES	ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	7.00E+00			YES		9.80E+00				YES	ND					1.21E+01	J			
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	4.35E+02		YES		YES	8.81E+01		YES		YES	4.46E+01		YES			1.28E+01				
VOLATILE ORGANIC COMPOUNDS																								
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	4.60E-02	J				2.40E-02	J				ND					4.60E-03	B			
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	3.50E-01	J				2.40E+00	J				7.80E-02	B				5.90E-02	B			
Bromomethane	mg/kg	NA	1.09E+01	NA	ND					ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					1.70E-03	J				ND					7.80E-03				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	5.30E-03	B				2.80E-03	B				6.00E-03	B				7.30E-03	B			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	8.70E-03	J				5.40E-03					ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	3.70E-03	J				ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																								
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					5.30E-02	J				ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					1.30E-01	J				ND					3.90E-02	J			
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					1.40E-01	J		YES	YES	ND					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					1.70E-01	J				ND					3.60E-02	J			
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					1.20E-01	J				ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					1.30E-01	J				ND					5.20E-02	J			
Butyl benzyl phthalate	mg/kg	NA	1.56E+03	2.40E-01	ND					ND					ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA	ND					5.00E-02	J				ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					1.40E-01	J				ND					5.80E-02	J			
Di-n-octyl phthalate	mg/kg	NA	1.56E+02	7.09E+02	ND					ND					ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					5.30E-02	J				ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	4.60E-02	J				2.70E-01	J			YES	ND					1.00E-01	J			
Hexachlorobenzene	mg/kg	NA	3.93E-01	2.50E-03	ND					ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					1.00E-01	J				ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					1.80E-01	J			YES	ND					4.20E-02	J			
Phenol	mg/kg	NA	4.66E+03	5.00E-02	ND					ND					ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	4.40E-02	J				2.00E-01	J			YES	ND					8.20E-02	J			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	4.70E-02	B				9.80E-02	B				5.20E-02	B				4.90E-02	B			

Table 5-1

**Surface and Depositional Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)						FTA-147 FTA-147-GP09 EG0017 29-Oct-98 0- 1					FTA-147 FTA-147-GP10 EG0029 15-Oct-98 0- 1					FTA-147 FTA-147-GP11 EG0021 15-Oct-98 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																				
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	YES	5.43E+03				YES	2.82E+03				YES	5.81E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01		7.30E+00			YES		1.40E+00			YES		2.20E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02		5.81E+01					5.37E+01					3.90E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00		5.90E-01					ND					ND				
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00		ND					6.10E-01		YES			ND				
Calcium	mg/kg	1.72E+03	NA	NA		1.83E+03		YES			2.39E+04		YES			ND				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	YES	1.28E+01				YES	9.20E+00				YES	8.20E+00				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01		6.90E+00					ND					8.50E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01		1.32E+01		YES			4.40E+00	J				3.60E+00	J			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	YES	1.31E+04			YES	YES	4.11E+03			YES	YES	9.86E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01		3.47E+01	J				2.39E+01					5.90E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05		1.03E+03					8.47E+03		YES			ND				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	YES	3.97E+02			YES	YES	3.65E+02			YES	YES	7.35E+02			YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01		ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01		9.20E+00					ND					ND				
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01		6.30E-01		YES			ND					5.70E-01		YES		
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	YES	7.00E+00				YES	9.40E+00	J			YES	8.00E+00	J			YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01		4.73E+01		YES			1.75E+01	B				8.80E+00	B			
VOLATILE ORGANIC COMPOUNDS																				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01		1.60E-02	J				4.70E-03	J				6.10E-03	J			
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02		ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00		1.60E-01	J				4.30E-02	B				5.00E-01	B			
Bromomethane	mg/kg	NA	1.09E+01	NA		ND					ND					1.80E-03	J			
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02		ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00		4.50E-03	B				2.60E-03	B				2.40E-03	B			
Toluene	mg/kg	NA	1.55E+03	5.00E-02		4.70E-03	J				ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01		ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA		ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01		ND					ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00		ND					2.70E-01	J				ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01		3.80E-02	J				5.00E-01	J		YES	YES	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01		4.40E-02	J				4.90E-01	J				ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02		ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02		ND					9.30E-01	J				ND				
Butyl benzyl phthalate	mg/kg	NA	1.56E+03	2.40E-01		ND					ND					ND				
Carbazole	mg/kg	NA	3.11E+01	NA		ND					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00		ND					7.30E-01	J				ND				
Di-n-octyl phthalate	mg/kg	NA	1.56E+02	7.09E+02		ND					ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01		ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	YES	5.30E-02	J				9.80E-01	J			YES	ND				
Hexachlorobenzene	mg/kg	NA	3.93E-01	2.50E-03		ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02		ND					2.80E-01	J				ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01		ND					ND					ND				
Phenol	mg/kg	NA	4.66E+03	5.00E-02		ND					ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01		4.00E-02	J				8.90E-01	J			YES	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01		ND					2.80E-01	J				ND				



**Table 5-1**

**Surface and Depositional Soil Analytical Results  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

For SVOCs, concentration listed is the background screening value for soils adjacent to asphalt as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-2

**Subsurface Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-147 FTA-147-GP02 EG0004 15-Oct-98 10-12				FTA-147 FTA-147-GP03 EG0005 14-Oct-98 3-5				FTA-147 FTA-147-GP04 EG0009 29-Oct-98 2-4				FTA-147 FTA-147-GP05 EG0011 29-Oct-98 3-5			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.33E+04			YES	1.38E+04		YES	YES	4.55E+03				4.69E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	1.26E+01			YES	5.90E+00			YES	4.70E+00		YES		6.90E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	5.58E+01				1.05E+02				2.51E+01				5.75E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	3.00E+00	J	YES		2.30E+00	J	YES		5.50E-01				6.50E-01			
Calcium	mg/kg	6.37E+02	NA	1.79E+03		YES		1.62E+03		YES		ND				ND			
Chromium	mg/kg	3.83E+01	2.32E+01	1.89E+01				1.81E+01				1.98E+01				2.90E+01			YES
Cobalt	mg/kg	1.75E+01	4.68E+02	5.05E+01		YES		1.53E+01				7.50E+00				1.07E+01			
Copper	mg/kg	1.94E+01	3.13E+02	2.98E+01	J	YES		2.29E+01	J	YES		7.80E+00				8.50E+00			
Iron	mg/kg	4.48E+04	2.34E+03	5.18E+04		YES	YES	2.86E+04			YES	2.16E+04			YES	2.88E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	3.78E+01				1.13E+01				8.40E+00	J			1.40E+01	J		
Magnesium	mg/kg	7.66E+02	NA	9.04E+02		YES		7.16E+02				ND				ND			
Manganese	mg/kg	1.36E+03	3.63E+02	1.45E+03		YES	YES	5.00E+02			YES	2.64E+02				3.81E+02			YES
Mercury	mg/kg	7.00E-02	2.33E+00	6.40E-02	B			6.30E-02	B			ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	6.18E+01		YES		8.10E+00				4.40E+00				4.30E+00			
Potassium	mg/kg	7.11E+02	NA	8.53E+02	J	YES		7.11E+02	J	YES		ND				ND			
Selenium	mg/kg	4.70E-01	3.91E+01	7.20E-01		YES		7.30E-01		YES		5.50E-01		YES		ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	ND				1.28E+01	J			ND				1.08E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.78E+02		YES		4.10E+01		YES		2.47E+01	B			1.86E+01	B		
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
2-Butanone	mg/kg	NA	4.66E+03	4.80E-03	J			ND				4.50E-03	J			5.50E-03	J		
Acetone	mg/kg	NA	7.76E+02	4.10E-01	J			3.20E-01	J			1.50E-01	J			1.50E+00	J		
Bromomethane	mg/kg	NA	1.09E+01	ND				ND				2.70E-03	J			ND			
Carbon disulfide	mg/kg	NA	7.77E+02	2.40E-02				ND				ND				ND			
Ethylbenzene	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	2.60E-03	B			4.70E-03	B			4.00E-03	B			3.20E-03	B		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				ND			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	5.00E-02	J			ND				ND				4.00E-02	J		
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	3.90E-02	J			ND				ND				3.00E-02	J		
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				5.00E-02	B			7.00E-02	B			4.70E-02	B		

Table 5-2

**Subsurface Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-147 FTA-147-GP07 EG0014 14-Oct-98 4-6				FTA-147 FTA-147-GP08 EG0016 14-Oct-98 4-6				FTA-147 FTA-147-GP09 EG0018 29-Oct-98 8-10				FTA-147 FTA-147-GP10 EG0019 15-Oct-98 4-6			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/kg	1.36E+04	7.80E+03	5.87E+03				9.20E+03			YES	7.00E+03				6.75E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	1.70E+00			YES	4.00E+00			YES	8.00E+00			YES	7.50E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	4.89E+01				8.79E+01				6.34E+01				3.58E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	ND				1.10E+00	J	YES		2.10E+00		YES		6.50E-01	J		
Calcium	mg/kg	6.37E+02	NA	ND				8.11E+02		YES		8.95E+02		YES		1.70E+03		YES	
Chromium	mg/kg	3.83E+01	2.32E+01	1.22E+01				1.36E+01				2.98E+01			YES	3.40E+01			YES
Cobalt	mg/kg	1.75E+01	4.68E+02	6.30E+00				1.58E+01				1.22E+01				1.85E+01		YES	
Copper	mg/kg	1.94E+01	3.13E+02	5.50E+00	J			1.23E+01	J			9.00E+00				1.09E+01	J		
Iron	mg/kg	4.48E+04	2.34E+03	1.14E+04			YES	1.73E+04			YES	4.03E+04			YES	3.42E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	6.40E+00				9.80E+00				1.10E+01	J			1.19E+01			
Magnesium	mg/kg	7.66E+02	NA	ND				5.68E+02				ND				7.84E+02		YES	
Manganese	mg/kg	1.36E+03	3.63E+02	1.81E+02				1.06E+03			YES	7.46E+02			YES	4.15E+02			YES
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				4.30E-02				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	5.10E+00				8.90E+00				9.60E+00				5.70E+00			
Potassium	mg/kg	7.11E+02	NA	ND				ND				ND				ND			
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				ND				5.70E-01		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	9.50E+00	J			9.50E+00	J			1.36E+01				6.10E+00	J		
Zinc	mg/kg	3.49E+01	2.34E+03	1.16E+01				2.62E+01				2.72E+01	B			2.18E+01	B		
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
2-Butanone	mg/kg	NA	4.66E+03	ND				3.00E-03	B			ND				5.30E-03	J		
Acetone	mg/kg	NA	7.76E+02	4.90E-02	B			1.10E-01	B			4.10E-02	B			2.30E-01	J		
Bromomethane	mg/kg	NA	1.09E+01	ND				ND				1.50E-03	J			ND			
Carbon disulfide	mg/kg	NA	7.77E+02	ND				6.20E-03				ND				ND			
Ethylbenzene	mg/kg	NA	7.77E+02	2.30E-03	J			ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	7.10E-03	B			7.70E-03	B			3.40E-03	B			3.00E-03	B		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				ND				ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				ND				ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				ND				ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				ND				3.80E-02	J		
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				ND				ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				ND				6.10E-02	J		
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				ND				ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				ND				4.20E-02	J		
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	5.20E-02	B			1.20E-01	B			ND				ND			

Table 5-2

**Subsurface Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 3 of 4)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				FTA-147 FTA-147-GP12 EG0023 14-Oct-98 9-11				FTA-147 FTA-147-GP13 EG0024 13-Oct-98 10-12				FTA-147 FTA-147-GP14 EG0025 13-Oct-98 4-5				FTA-147 FTA-147-GP15 EG0026 14-Oct-98 4-6			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/kg	1.36E+04	7.80E+03	6.40E+03				3.61E+03				5.61E+03				6.11E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	1.39E+01		YES		3.80E+00		YES		5.20E+00		YES		1.50E+01			YES
Barium	mg/kg	2.34E+02	5.47E+02	4.91E+01				ND				2.77E+01				7.05E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	9.30E-01	J	YES		ND				ND				8.20E-01	J		
Calcium	mg/kg	6.37E+02	NA	ND				ND				ND				ND			
Chromium	mg/kg	3.83E+01	2.32E+01	1.27E+01				9.30E+00				1.49E+01				3.70E+01			YES
Cobalt	mg/kg	1.75E+01	4.68E+02	6.81E+01		YES		8.60E+00				1.44E+01				1.45E+01			
Copper	mg/kg	1.94E+01	3.13E+02	2.99E+01	J	YES		2.56E+01	J	YES		8.20E+00	J			1.43E+01	J		
Iron	mg/kg	4.48E+04	2.34E+03	3.93E+04			YES	2.63E+04			YES	2.59E+04			YES	4.82E+04		YES	YES
Lead	mg/kg	3.85E+01	4.00E+02	4.93E+01		YES		1.15E+01				1.09E+01				2.11E+01			
Magnesium	mg/kg	7.66E+02	NA	ND				ND				ND				ND			
Manganese	mg/kg	1.36E+03	3.63E+02	1.79E+03		YES	YES	1.04E+02				3.83E+02			YES	6.98E+02			YES
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	1.14E+01				ND				ND				9.90E+00			
Potassium	mg/kg	7.11E+02	NA	ND				ND				ND				ND			
Selenium	mg/kg	4.70E-01	3.91E+01	ND				8.00E-01		YES		7.80E-01		YES		9.70E-01		YES	
Vanadium	mg/kg	6.49E+01	5.31E+01	6.50E+00	J			ND				ND				ND			
Zinc	mg/kg	3.49E+01	2.34E+03	5.22E+01		YES		2.36E+01				2.00E+01				3.77E+01		YES	
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
2-Butanone	mg/kg	NA	4.66E+03	ND				ND				3.60E-03	B			ND			
Acetone	mg/kg	NA	7.76E+02	4.80E-02	B			5.50E-01	J			6.60E-02	B			3.20E-02	B		
Bromomethane	mg/kg	NA	1.09E+01	ND				ND				ND				ND			
Carbon disulfide	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Ethylbenzene	mg/kg	NA	7.77E+02	ND				ND				ND				ND			
Methylene chloride	mg/kg	NA	8.41E+01	7.50E-03	B			3.40E-03	B			3.00E-03	B			6.30E-03	B		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Benzo(a)anthracene	mg/kg	NA	8.51E-01	ND				ND				3.30E-02	J			ND			
Benzo(a)pyrene	mg/kg	NA	8.51E-02	ND				ND				2.00E-01	J		YES	ND			
Benzo(b)fluoranthene	mg/kg	NA	8.51E-01	ND				ND				3.10E-01	J			ND			
Benzo(ghi)perylene	mg/kg	NA	2.32E+02	ND				ND				1.00E-01	J			ND			
Benzo(k)fluoranthene	mg/kg	NA	8.51E+00	ND				ND				2.60E-01	J			ND			
Chrysene	mg/kg	NA	8.61E+01	ND				ND				3.90E-02	J			ND			
Di-n-butyl phthalate	mg/kg	NA	7.80E+02	ND				7.80E-02	J			ND				ND			
Fluoranthene	mg/kg	NA	3.09E+02	ND				ND				4.60E-02	J			ND			
Indeno(1,2,3-cd)pyrene	mg/kg	NA	8.51E-01	ND				ND				9.10E-02	J			ND			
Pyrene	mg/kg	NA	2.33E+02	ND				ND				4.20E-02	J			ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				1.10E-01	B			ND				5.20E-02	B		

**Table 5-2**  
**Subsurface Soil Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-3

**Groundwater Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 3)

Parcel Sample Location Sample Number Sample Date				FTA-147 FTA-147-GP01 EG3001 25-Jan-99				FTA-147 FTA-147-GP02 EG3002 25-Jan-99				FTA-147 FTA-147-GP04 EG3003 25-Jan-99				FTA-147 FTA-147-GP05 EG3006 26-Jan-99				FTA-147 FTA-147-GP07 EG3008 22-Jan-99			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																							
Aluminum	mg/L	2.34E+00	1.56E+00	4.95E-01				4.50E-01				3.22E-01				5.90E-01				2.40E-01	B		
Barium	mg/L	1.27E-01	1.10E-01	2.67E-02	J			2.12E-02	J			1.38E-02	J			1.61E-02	J			1.29E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	4.70E-04	B			5.90E-04	B			1.50E-04	B			1.50E-04	B			ND			
Calcium	mg/L	5.65E+01	NA	2.19E+00	J			7.76E-01	J			2.38E+00	J			4.87E+00	J			4.96E+00	J		
Chromium	mg/L	NA	4.69E-03	2.50E-03	J			ND				2.00E-03	J			1.20E-03	J			ND			
Cobalt	mg/L	2.34E-02	9.39E-02	1.06E-02	J			1.06E-02	J			ND				ND				ND			
Copper	mg/L	2.55E-02	6.26E-02	5.40E-03	B			8.90E-03	B			5.20E-03	B			2.70E-03	B			ND			
Iron	mg/L	7.04E+00	4.69E-01	7.28E-01		YES		5.18E-01		YES		6.34E-01		YES		6.86E-01		YES		9.94E-01			YES
Lead	mg/L	7.99E-03	1.50E-02	1.40E-03	J			ND				ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	1.14E+00	J			5.92E-01	J			7.38E-01	J			1.28E+00	J			8.61E-01	J		
Manganese	mg/L	5.81E-01	7.35E-02	6.64E-01		YES	YES	3.09E-01			YES	4.12E-02				2.61E-02				1.66E-01			YES
Mercury	mg/L	NA	4.60E-04	ND				ND				ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				1.09E-02	J			ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	9.08E-01	B			1.88E+00	B			2.07E+00	B			1.20E+00	B			ND			
Sodium	mg/L	1.48E+01	NA	2.29E+00	J			1.11E+00	B			2.50E+00	J			1.08E+00	B			1.40E+00	B		
Vanadium	mg/L	1.70E-02	1.10E-02	ND				2.50E-03	B			3.80E-03	B			2.60E-03	B			ND			
Zinc	mg/L	2.20E-01	4.69E-01	1.14E-01				1.65E-02	J			ND				ND				1.85E-02	B		
<b>VOLATILE ORGANIC COMPOUNDS</b>																							
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				ND				ND			
Benzene	mg/L	NA	1.40E-03	ND				ND				ND				ND				ND			
Bromodichloromethane	mg/L	NA	1.08E-03	ND				5.20E-04	J			5.00E-04	J			ND				2.90E-04	J		
Chloroform	mg/L	NA	1.15E-03	8.00E-04	B			2.20E-03	B		YES	2.40E-03	B		YES	ND				2.00E-03	B		YES
Methylene chloride	mg/L	NA	7.85E-03	ND				ND				ND				ND				1.10E-03	B		
Naphthalene	mg/L	NA	3.00E-03	ND				ND				ND				ND				ND			
Toluene	mg/L	NA	2.59E-01	ND				ND				ND				ND				ND			
Trichloroethene	mg/L	NA	4.50E-03	ND				3.50E-04	J			3.00E-04	J			ND				6.10E-04	J		
n-Butylbenzene	mg/L	NA	9.57E-03	ND				ND				ND				ND				ND			
sec-Butylbenzene	mg/L	NA	1.06E-02	ND				ND				ND				ND				ND			
tert-Butylbenzene	mg/L	NA	1.14E-02	ND				ND				ND				ND				ND			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																							
bis(2-Ethylhexyl)phthalate	mg/L	NA	4.30E-03	ND				ND				3.60E-03	J			3.30E-03	B			ND			

Table 5-3

**Groundwater Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Parcel Sample Location Sample Number Sample Date				FTA-147 FTA-147-GP08 EG3009 22-Jan-99				FTA-147 FTA-147-GP09 EG3010 26-Jan-99				FTA-147 FTA-147-GP10 EG3011 22-Jan-99				FTA-147 FTA-147-GP11 EG3012 22-Jan-99			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/L	2.34E+00	1.56E+00	2.30E-01	B			1.68E-01	B			6.93E-02	B			3.47E-01			
Barium	mg/L	1.27E-01	1.10E-01	4.02E-02	J			2.72E-02	J			2.79E-02	J			2.45E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				1.20E-04	B			ND				ND			
Calcium	mg/L	5.65E+01	NA	4.29E+00	J			2.12E+01				7.17E+00				3.31E+00	J		
Chromium	mg/L	NA	4.69E-03	ND				7.80E-04	J			ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	1.62E-02	J			ND				1.67E-02	J			ND			
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	2.30E-01				2.03E-01				5.46E-02	B			8.44E-01			YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	2.12E+00	J			2.77E+00	J			2.70E+00	J			7.65E-01	J		
Manganese	mg/L	5.81E-01	7.35E-02	6.57E-01		YES	YES	1.71E-01			YES	7.90E-01		YES	YES	2.19E+00		YES	YES
Mercury	mg/L	NA	4.60E-04	ND				ND				6.70E-05	J			ND			
Nickel	mg/L	NA	3.13E-02	ND				ND				ND				1.62E-02	J		
Potassium	mg/L	7.20E+00	NA	2.54E+00	J			7.49E-01	B			9.53E-01	J			1.37E+01		YES	
Sodium	mg/L	1.48E+01	NA	3.74E+00	J			1.64E+00	B			1.29E+00	B			4.85E+00	J		
Vanadium	mg/L	1.70E-02	1.10E-02	ND				2.80E-03	B			ND				ND			
Zinc	mg/L	2.20E-01	4.69E-01	8.42E-02	B			ND				ND				ND			
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				4.30E-03	B		
Benzene	mg/L	NA	1.40E-03	ND				ND				ND				1.30E-04	J		
Bromodichloromethane	mg/L	NA	1.08E-03	ND				ND				4.80E-04	J			ND			
Chloroform	mg/L	NA	1.15E-03	7.30E-04	B			3.70E-04	B			4.00E-03	B		YES	ND			
Methylene chloride	mg/L	NA	7.85E-03	1.00E-03	B			ND				1.10E-03	B			1.10E-03	B		
Naphthalene	mg/L	NA	3.00E-03	ND				ND				ND				3.10E-04	J		
Toluene	mg/L	NA	2.59E-01	1.70E-04	B			ND				ND				2.30E-04	B		
Trichloroethene	mg/L	NA	4.50E-03	ND				ND				9.50E-04	J			ND			
n-Butylbenzene	mg/L	NA	9.57E-03	ND				ND				ND				1.50E-04	J		
sec-Butylbenzene	mg/L	NA	1.06E-02	ND				ND				ND				4.70E-04	J		
tert-Butylbenzene	mg/L	NA	1.14E-02	ND				ND				ND				1.00E-03			
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
bis(2-Ethylhexyl)phthalate	mg/L	NA	4.30E-03	1.10E-02	J		YES	5.30E-03	B		YES	ND				ND			

**Table 5-3**

**Groundwater Analytical Results  
Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/L - Milligrams per liter

NA - Not available

ND - Not detected

Qual - Data validation qualifier



Table 5-4

**Surface Water Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

Parcel Sample Location Sample Number Sample Date					FTA-147 FTA-147-SW/SD01 EG2001 8-Feb-99					FTA-147 FTA-147-SW/SD02 EG2002 8-Feb-99					WATERSHED WS-147-SW/SD01 WS2003 8-Feb-99				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																			
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	4.42E-01				YES	8.30E-02	B				2.53E-01	B			YES
Barium	mg/L	7.53E-02	1.10E+00	3.90E-03	1.88E-02	J			YES	2.98E-02	J			YES	1.52E-02	J			YES
Calcium	mg/L	2.52E+01	NA	1.16E+02	3.53E+00	J				1.28E+01					6.37E+00				
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	6.71E-01					1.36E-01	B				3.47E-01				
Lead	mg/L	8.60E-03	1.50E-02	1.32E-03	ND					1.80E-03	J			YES	ND				
Magnesium	mg/L	1.10E+01	NA	8.20E+01	1.15E+00	J				2.35E+00	J				2.40E+00	J			
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	5.79E-02					2.30E-02					4.59E-02				
Potassium	mg/L	2.56E+00	NA	5.30E+01	9.80E-01	B				8.29E-01	B				1.21E+00	B			
Sodium	mg/L	3.44E+00	NA	6.80E+02	8.79E-01	B				1.09E+00	B				1.03E+00	B			
Thallium	mg/L	2.40E-03	1.01E-03	4.00E-03	ND					4.10E-03	J	YES	YES	YES	ND				
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
Chloroform	mg/L	NA	1.69E-01	2.89E-01	ND					4.50E-04	J				ND				
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
bis(2-Ethylhexyl)phthalate	mg/L	NA	5.17E-02	3.00E-04	4.70E-03	B			YES	ND					7.10E-03	B			YES

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama, July*.

<sup>b</sup> Recreational site user site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama, July*.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/L - Milligrams per liter

NA - Not available

ND - Not detected

Qual - Data validation qualifier

Table 5-5

**Sediment Analytical Results**  
**Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)**  
**Fort McClellan, Calhoun County, Alabama**

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					FTA-147 FTA-147-SW/SD01 EG1001 8-Feb-99 0- .5					FTA-147 FTA-147-SW/SD02 EG1003 8-Feb-99 0- .5					WATERSHED WS-147-SW/SD01 WS1003 8-Feb-99 0- .5				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																			
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	5.56E+03					5.04E+03					9.49E+03		YES		
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	8.60E+00				YES	3.20E+00					7.60E+00				YES
Barium	mg/kg	9.89E+01	8.36E+04	NA	3.84E+01					4.90E+01					6.32E+01				
Beryllium	mg/kg	9.70E-01	1.50E+02	NA	7.30E-01	J				1.00E+00		YES			6.60E-01	J			
Calcium	mg/kg	1.11E+03	NA	NA	4.87E+02	J				9.00E+02					1.51E+03		YES		
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	2.56E+01					7.80E+00					1.80E+01				
Cobalt	mg/kg	1.10E+01	6.72E+04	5.00E+01	8.10E+00					4.60E+00	J				6.30E+00	J			
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	3.14E+01		YES		YES	7.60E+00					1.57E+01				
Iron	mg/kg	3.53E+04	3.59E+05	NA	2.65E+04					9.50E+03					2.36E+04				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	1.22E+01					3.54E+01				YES	2.31E+01				
Magnesium	mg/kg	9.06E+02	NA	NA	3.19E+02	J				2.43E+02	J				7.85E+02	J			
Manganese	mg/kg	7.12E+02	4.38E+04	NA	3.08E+02					2.93E+02					2.33E+02				
Mercury	mg/kg	1.10E-01	2.99E+02	1.30E-01	3.80E-02	B				5.70E-02	B				7.20E-02				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	1.32E+01		YES			4.90E+00	J				1.03E+01				
Potassium	mg/kg	1.01E+03	NA	NA	1.06E+03		YES			2.42E+02	J				1.07E+03		YES		
Selenium	mg/kg	7.20E-01	5.96E+03	NA	1.30E+00		YES			6.90E-01					1.60E+00		YES		
Sodium	mg/kg	6.92E+02	NA	NA	1.08E+02	B				1.17E+02	B				1.10E+02	B			
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	2.82E+01					1.18E+01					2.52E+01				
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	3.20E+01					2.19E+01					6.20E+01		YES		
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
Acetone	mg/kg	NA	1.03E+05	4.53E-01	6.40E-02	J				4.20E-02	B				2.50E-02	B			
Methylene chloride	mg/kg	NA	9.84E+03	1.26E+00	1.10E-02	B				1.00E-02	B				9.90E-03	B			
p-Cymene	mg/kg	NA	2.08E+05	NA	ND					ND					1.60E-02				
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																			
Benzo(a)pyrene	mg/kg	NA	8.93E+00	3.30E-01	ND					3.30E-02	J				ND				
Benzo(ghi)perylene	mg/kg	NA	2.79E+04	6.55E-01	ND					4.70E-02	J				ND				
Phenol	mg/kg	NA	6.28E+05	2.73E-02	5.50E-02	J			YES	ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	5.41E+03	1.82E-01	1.50E-01	B				1.00E-01	B				1.40E-01	B			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Recreational site user site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than method detection limit but less than or equal to reporting limit.

mg/kg - Milligrams per kilogram

NA - Not available

ND - Not detected

Qual - Data validation qualifier

**Volatile Organic Compounds.** Nine VOCs were detected in surface and depositional soil samples collected at Former Motor Pool Area 3100, 23rd Street. The methylene chloride results, six of the acetone results, and two of the 2-butanone results were flagged with a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank sample.

VOC concentrations in surface and depositional soils were below SSSLs and ESVs.

**Semivolatile Organic Compounds.** Eighteen SVOCs, including twelve PAH compounds and six non-PAH compounds, were detected in surface and depositional soil samples collected at Former Motor Pool Area 3100, 23rd Street. SVOCs were not detected in the soils collected from sample location FTA-147-GP11. Five of the bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier, signifying that this compound was also detected in an associated laboratory or field blank sample.

The concentrations of the PAH benzo(a)pyrene (0.1 to 0.5 mg/kg) exceeded the SSSL (0.085 mg/kg) at three locations (FTA-147-DEP01, FTA-147-GP05, and FTA-147-GP10) but were below the PAH background screening value (1.42 mg/kg).

The concentrations of the PAHs benzo(a)pyrene (three locations), fluoranthene (five locations), and pyrene (four locations) exceeded ESVs but were below PAH background screening values. In addition, the SVOCs hexachlorobenzene (FTA-147-DEP02), phenol (FTA-147-DEP02), and bis(2-ethylhexyl)phthalate (FTA-147-DEP01 and FTA-147-DEP02) exceeded ESVs.

## **5.2 Subsurface Soil Analytical Results**

Twelve subsurface soil samples were collected for chemical analyses at Former Motor Pool Area 3100, 23rd Street. Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-2.

**Metals.** Eighteen metals were detected in subsurface soil samples collected at Former Motor Pool Area 3100, 23rd Street. Two of the mercury results and four of the zinc results were flagged with a “B” data qualifier signifying that these metals were also detected in an associated laboratory or field blank sample.

The concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded residential human health SSSLs. However, with the exception of iron at two locations (FTA-147-GP02 and FTA-147-GP15), the concentrations of these metals were below their respective background concentration or within the range of background values (Appendix H).

***Volatile Organic Compounds.*** Six VOCs (2-butanone, acetone, bromomethane, carbon disulfide, ethyl benzene, and methylene chloride) were detected in subsurface soil samples collected at Former Motor Pool Area 3100, 23rd Street. The methylene chloride results, six of the acetone results, and two of the 2-butanone results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. In addition, acetone, methylene chloride, and/or 2-butanone were the only detected VOCS at seven sample locations.

The VOC concentrations in subsurface soils were below SSSLs.

***Semivolative Organic Compounds.*** Eleven SVOCs, including nine PAH compounds and two non-PAH compounds, were detected in subsurface soil samples collected at the site. SVOCs were not detected at two locations (FTA-147-GP09 and FTA-147-GP12) and bis(2-ethylhexyl)phthalate and/or di-n-butyl phthalate were the only detected SVOCs at six additional locations. Sample location FTA-147-GP14 contained nine of the eleven detected SVOCs, all of which were PAH compounds.

With the exception of benzo(a)pyrene at one location, the SVOC concentrations in subsurface soils were below SSSLs. The concentration of benzo(a)pyrene (0.2 mg/kg) exceeded the SSSL (0.085 mg/kg) at sample location FTA-147-GP14.

### ***5.3 Groundwater Analytical Results***

Nine temporary monitoring wells were sampled at Former Motor Pool Area 3100, 23rd Street, at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-3.

***Metals.*** Seventeen metals, including aluminum, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc, were detected in groundwater samples collected at Former Motor Pool Area 3100, 23rd Street. Four of the aluminum results, the beryllium results, the copper results, five of the

potassium results, five of the sodium results, four of the vanadium results, and two of the zinc results were flagged with a “B” data qualifier signifying that these metals were also detected in an associated laboratory or field blank sample.

The concentrations of iron (six locations) and manganese (seven locations) exceeded residential human health SSSLs. With the exception of manganese at four locations, the concentrations of these metals were below their respective background concentration. However, the manganese results were within the range of background values (Appendix H).

***Volatile Organic Compounds.*** Eleven VOCs, including acetone, benzene, bromodichloromethane, chloroform, methylene chloride, naphthalene, toluene, trichloroethene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene, were detected in groundwater samples collected at Former Motor Pool Area 3100, 23rd Street. VOCs were not detected in the sample collected at location FTA-147-GP05. Sample locations FTA-147-GP01 and FTA-147-GP09 each contained only one of the detected VOCs (chloroform). The chloroform, methylene chloride, and toluene results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample.

With the exception of chloroform, the VOC concentrations in groundwater were below SSSLs. The concentrations of chloroform (0.002 milligrams per liter [mg/L] to 0.004 mg/L) exceeded the SSSL (0.0015 mg/L) at four locations.

***Semivolatile Organic Compounds.*** Bis(2-ethylhexyl)phthalate was detected in four of the groundwater samples collected at Former Motor Pool Area 3100, 23rd Street. Two of the bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier signifying that this compound was also detected in an associated laboratory or field blank sample. The bis(2-ethylhexyl)phthalate concentrations (0.011 mg/L and 0.0053 mg/L) exceeded the SSSL (0.0043 mg/L) at two sample locations (FTA-147-GP08 and FTA-147-GP09).

#### ***5.4 Surface Water Analytical Results***

Three surface water samples were collected for chemical analyses at Former Motor Pool Area 3100, 23rd Street, at the sample locations shown on Figure 3-1. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-4.

**Metals.** Ten metals were detected in surface water samples collected at Former Motor Pool Area 3100, 23rd Street. The potassium and sodium results, two of the aluminum results, and one of the iron results were flagged with a “B” data qualifier signifying that these metals were also detected in an associated laboratory or field blank sample.

The thallium concentration in the sample from FTA-147-SW/SD02 exceeded the SSSL and the respective background concentration. However, the thallium concentration was within the range of background values (Appendix H).

Aluminum (FTA-147-SW/SD01 and WS-147-SW/SD01), barium (three locations), lead (FTA-147-SW/SD02), and thallium (FTA-147-SW/SD02) concentrations exceeded ESVs, but were below their respective background concentration or within the range of background values.

**Volatile Organic Compounds.** Chloroform was detected in one surface water sample (FTA-147-SW/SD02) at a concentration below the SSSL and ESV.

**Semivolatile Organic Compounds.** Bis(2-ethylhexyl)phthalate was detected in two of the surface water samples collected at Former Motor Pool Area 3100, 23rd Street. The bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier, signifying that this compound was also detected in an associated laboratory or field blank sample.

The bis(2-ethylhexyl)phthalate concentrations (0.0047 mg/L and 0.0071 mg/L) were below the SSSL but exceeded the ESV (0.0003 mg/L) at both locations.

## **5.5 Sediment Analytical Results**

Three sediment samples were collected for chemical and physical analyses at Former Motor Pool Area 3100, 23rd Street. Samples were collected from the upper 0.5-foot of sediment at the sample locations shown on Figure 3-1. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-5.

**Metals.** Nineteen metals were detected in the sediment samples collected at Former Motor Pool Area 3100, 23rd Street. The sodium results and two of the mercury results were flagged with a “B” data qualifier signifying that these metals were also detected in an associated laboratory or field blank sample.

The metals concentrations in sediments were below SSSLs. Arsenic (FTA-147-SW/SD01 and WS-147-SW/SD01), copper (FTA-147-SW/SD01), and lead (FTA-147-SW/SD02) concentrations exceeded ESVs. However, the concentrations of these metals were below their respective background concentration or within the range of background values (Appendix H).

***Volatile Organic Compounds.*** Acetone, methylene chloride, and p-cymene were detected in sediment samples collected at Former Motor Pool Area 3100, 23rd Street. The methylene chloride results and two of the acetone results were flagged with a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank sample.

VOC concentrations in sediments were below SSSLs and ESVs.

***Semivolatile Organic Compounds.*** Four SVOCs, including benzo(a)pyrene, benzo(g,h,i)perylene, phenol, and bis(2-ethylhexyl)phthalate, were detected in sediment samples collected at Former Motor Pool Area 3100, 23rd Street. The bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier signifying that this compound was also detected in an associated laboratory or field blank sample.

SVOC concentrations in sediments were below SSSLs. The concentration of phenol (0.055 mg/kg) exceeded the ESV (0.0273 mg/kg) at one sample location (FTA-147-SW/SD01).

***Total Organic Carbon.*** The sediment samples were analyzed for TOC content. TOC concentrations ranged from 6,300 mg/kg to 18,800 mg/kg, as summarized in Appendix E.

***Grain Size.*** The results of grain size analysis for the sediment samples are included in Appendix E.

## **6.0 Summary and Conclusions and Recommendations**

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IT, under contract with USACE, completed an SI at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), consisted of the sampling and analyses of nine surface soil samples, twelve subsurface soil samples, nine groundwater samples, two depositional soil samples, and three surface water and sediment samples. In addition, nine temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

The analytical results indicate that metals, VOCs, and SVOCs were detected in the environmental media sampled. Analytical results were compared to the human health SSSLs and ESVs. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, metals results exceeding the SSSLs and ESVs were compared to media-specific background concentrations (SAIC, 1998), and SVOC (PAH compounds) concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values (IT, 2000b).

The potential impact to human receptors is expected to be minimal. Although the site is currently being used by the City of Anniston as a motor pool area, the soils and groundwater data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, with the exception of cadmium (two depositional soil samples) and iron (one subsurface soil sample), the metals that exceeded residential human health SSSLs were below their respective background concentration or within the range of background values, and thus, do not pose an unacceptable risk to future human receptors. The PAH compound benzo(a)pyrene was detected in three surface soil samples and one subsurface soil sample at concentrations (0.1 mg/kg to 0.5 mg/kg) exceeding the SSSL (0.085 mg/kg). The benzo(a)pyrene concentrations in the surface soils were below the PAH background value.

In groundwater, one VOC (chloroform) was detected in four samples at concentrations (0.002 mg/L to 0.004 mg/L) marginally exceeding the SSSL (0.00115 mg/L). However, the chloroform



results were flagged with a “B” data qualifier indicating that chloroform was also detected in an associated laboratory or field blank sample. Additionally, the SVOC bis(2-ethylhexyl)phthalate was detected in two groundwater samples at concentrations exceeding the SSSL. However, bis(2-ethylhexyl)phthalate is a common laboratory contaminant and is probably not related to site activities.

The potential threat to ecological receptors is also expected to be low and is limited to metals and SVOCs in surface and depositional soils. The concentrations of three metals (cadmium, lead, and zinc) exceeded ESVs and background concentrations in a limited number of surface and depositional soil samples. In addition, six SVOCs, including three PAH compounds, exceeded ESVs in a limited number of surface and depositional soil samples. The PAH concentrations were below PAH background values. The majority of the site is a well-developed area consisting of buildings and paved road areas and is currently being used by the City of Anniston as a motor pool area. Based on the low levels and limited spatial distribution of the metals and SVOCs detected at the site, the potential threat to ecological receptors is expected to be low.

Based on the results of the SI, past operations at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7), do not appear to have adversely impacted the environment. The metals and chemical compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse with regard to hazardous, toxic, and radioactive waste at Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7).

## 7.0 References

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## **APPENDIX A**

### **SAMPLE COLLECTION LOGS AND ANALYSIS REQUEST/ CHAIN OF CUSTODY RECORDS**

## **APPENDIX B**

### **BORING LOGS AND WELL CONSTRUCTION LOGS**

## **APPENDIX C**

### **WELL DEVELOPMENT LOGS**

# **APPENDIX D**

## **SURVEY DATA**

## Appendix D

### Survey Data

Former Motor Pool Area 3100, 23rd Street, Parcels 147(7), 27(7), 28(7), and 72(7)  
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)
FTA-147-DEP01	1166346.70	665597.93	790.20	NA
FTA-147-DEP02	1166485.13	665557.81	790.41	NA
FTA-147-GP01	1166397.92	665380.97	794.62	794.22
FTA-147-GP02	1166371.84	665337.56	794.84	794.49
FTA-147-GP03	1166433.47	665313.30	795.00	NA
FTA-147-GP04	1166160.17	665358.99	793.90	797.01
FTA-147-GP05	1166182.83	665457.57	792.96	795.02
FTA-147-GP06	1166213.23	665331.61	795.71	NA
FTA-147-GP07	1166251.93	665463.69	794.39	794.21
FTA-147-GP08	1166456.32	665531.13	791.91	791.70
FTA-147-GP09(W)	1166212.42	665580.38	790.87	791.16
FTA-147-GP09(SS)	1166223.48	665564.50	791.90	NA
FTA-147-GP10(W)	1166172.22	665311.25	795.32	795.65
FTA-147-GP10(SS)	1166172.67	665285.91	787.30	NA
FTA-147-GP11	1166296.07	665251.09	796.45	796.09
FTA-147-GP12	1166459.59	665277.76	794.40	NA
FTA-147-GP13	1166441.31	665246.83	795.75	NA
FTA-147-GP14	1166417.42	665236.76	796.25	NA
FTA-147-GP15	1166192.30	665309.48	795.79	NA
FTA-147-SW/SD01	1166144.71	665296.80	794.27	NA
FTA-147-SW/SD02	1166410.86	665707.58	784.87	NA
WS-147-SW/SD01	1165929.63	664922.81	802.55	NA

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum (NAD83), 1983

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

ft - Feet.

msl - Mean sea level.

NA - Not applicable, temporary well not installed.



## **APPENDIX E**

### **SUMMARY OF VALIDATED ANALYTICAL DATA**

## **APPENDIX F**

### **DATA VALIDATION SUMMARY REPORT**

## **APPENDIX G**

### **VARIANCES/NONCONFORMANCES**

## **APPENDIX H**

### **SUMMARY STATISTICS FOR BACKGROUND MEDIA, FORT MCCLELLAN, ALABAMA**

## **ATTACHMENT 1**

### **LIST OF ABBREVIATIONS AND ACRONYMS**